

Amendments to Claims

1. (Currently Amended) A method of laser welding aluminum or magnesium members, said method comprising:

positioning said members together in contact between facing surfaces thereof to expose a first outer surface of at least one of said members to laser irradiation;

directing a welding laser beam at said members so as to form a molten weld pool to fuse said members together;

moving said welding laser beam relative to said members; and

heating a zone of said members around the molten metal pool with a heating source supplemental to the welding laser beam so as to slow the rate of solidification of said molten weld pool, thereby enabling formation of a substantially porosity-free weld bead joining said members.

2. (Cancelled)

3. (Original) A method as claimed in claim 1 wherein said heating step includes positioning a heat source at a second outer surface of at least one of said members that is substantially opposite of said first outer surface.

4. (Original) A method as claimed in claim 1 wherein said heating step includes positioning a heat source at said first outer surface.

5. (original) A method as claimed in claim 4, wherein said heating step includes said heat source being a heating laser beam that is fractionated from said welding laser beam.

6. (Currently Amended) A method of forming a linear weld between upper and lower members composed of aluminum or magnesium, said method comprising:

positioning said upper and lower members together in contact between facing surfaces thereof to expose a first outer surface of said upper member to laser irradiation;

moving a welding laser beam in a path over said first outer surface, said welding laser beam having an energy and width to progressively melt a trough of molten metal to a depth through said upper member and into said lower member, said molten metal in said trough having a void filled with gas, and said molten metal re-solidifying into re-solidified metal after the passage of said welding laser beam; and

heating in and around said trough with a heating source supplemental to the welding laser beam to slow the rate of solidification of said molten metal into said re-solidified metal, thereby preventing entrainment of said gas within said re-solidified metal, the supplemental heating source being positioned at a second outer surface of at least one of said members that is substantially opposite of said first outer surface.

7. (Original) A method as claimed in claim 6, wherein said moving step includes the depth of said trough being greater than its width.

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Currently Amended) A method of improving the quality of a laser weld joining an assembly of members, said method comprising:

moving a welding laser beam in a path over said assembly, said welding laser beam having an energy and width to progressively melt a trough of molten metal to a depth through said upper member and into said lower member, said molten metal in said trough having a void filled with gas, and said molten metal re-solidifying into re-solidified metal after the passage of said welding laser beam; and

directing heat from a heating source supplemental to the welding laser beam toward said trough of molten metal and in accordance with said path so as to widen a heat-affected zone

around said trough for slowing the rate of solidification of said molten metal into said re-solidified metal, thereby preventing entrainment of said gas within said re-solidified metal, the supplemental heating source being positioned on an opposite side of said assembly from said welding laser beam.

13. (Original) A method as claimed in claim 12, wherein the depth of said trough is greater than its width.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)